

Conservation and Preservation of the Appalachian Snaketail Dragonfly in Savage, Maryland

The **Appalachian Snaketail dragonfly** (*Ophiogomphus incurvatus incurvatus*) is a rare insect whose environment is threatened by overdevelopment. In order to ensure its survival, we must do all we can to protect it.

Photo of Appalachian Snaketail dragonfly

- from <http://www.arkive.org/appalachian-Snaketail/ophiogomphus-incurvatus/#>



Background

Dragonflies have been around for 320 million years, long before the first dinosaur. The largest dragonfly had a wingspan of 24 inches. Today, the largest dragonfly is found in South America and has a wingspan of slightly over seven inches. The Appalachian Snaketail grows up to two inches and is found in high concentration in the area of Savage, Maryland.

- from *“Dragonflies at Animal Corner”*

<http://www.animalcorner.co.uk/insects/dragonfly/dragonfly.html>,

<http://howardbirds.org/odonates/pdfs/APS.N.pdf>, and Dr. Richard Orr of the Mid-Atlantic Invertebrate Field Studies office

Lifecycle

Like all insects, dragonflies start as **eggs** which are laid in or near water. For species that lay their eggs near water, development will not begin until the rains come and the water level rises. If the temperature is appropriate, larvae will hatch from the eggs in less than a month.

- from "Dragonfly Life Cycle" <http://bfec.kenyon.edu/dragonfly/lifecycle.htm>

The below photo shows dragonfly eggs, not necessarily those of the Appalachian Snaketail.

- from <http://winterwoman.net/2007/07/30/dragonfly-eggs/>



The larva or **nymph** will grow rapidly feeding on small aquatic organisms. Nymphs have a specialized lip that can be rapidly extended up to 1/3 the length of the body to help them capture prey. As the nymphs grow, they will switch to hunting larger insects, including mosquito larvae. Nymphs will molt or shed their skin 10 to 15 times before they are mature. This stage will generally last between one and three years.

- from "Dragonfly Life Cycle" <http://bfec.kenyon.edu/dragonfly/lifecycle.htm> and "How Long Do Dragonflies Live?" <http://www.dragonfly-site.com/how-long-dragonflies-live.html>

The below photo is the shed skin of an Appalachian Snaketail nymph.
- from http://mamomi.net/Gomphidae/Pages/Appalachian_Snaketail_-_Ophiogomphus_incurvatus.html



Unlike most of the other species of insect, dragonflies do not pupate. Instead of pupating, the larval form or nymph will come out from its aquatic environment and hang from the bank or a stem. This position makes it easier for the larvae to be exposed to the warmth of the sunshine and undergo metamorphosis into an adult dragonfly.

- from "How Long Do Dragonflies Live?" <http://www.dragonfly-site.com/how-long-dragonflies-live.html>

Once the larva's transformation is complete, the newly emerged adult will have to wait several hours before its wings dry out and become strong enough to fly. The dragonfly at this stage is called a **teneral** which is a Latin word meaning tender or soft or delicate. I like to equate them to softshell crabs. Once the adult becomes capable of flying, it becomes once more a voracious predator, eating many times their weight in mosquitoes every day.

- from "How Long Do Dragonflies Live?" <http://www.dragonfly-site.com/how-long-dragonflies-live.html> and "The Dragonfly" <http://beneficialbugs.org/bugs/Dragonfly/dragonfly.htm>

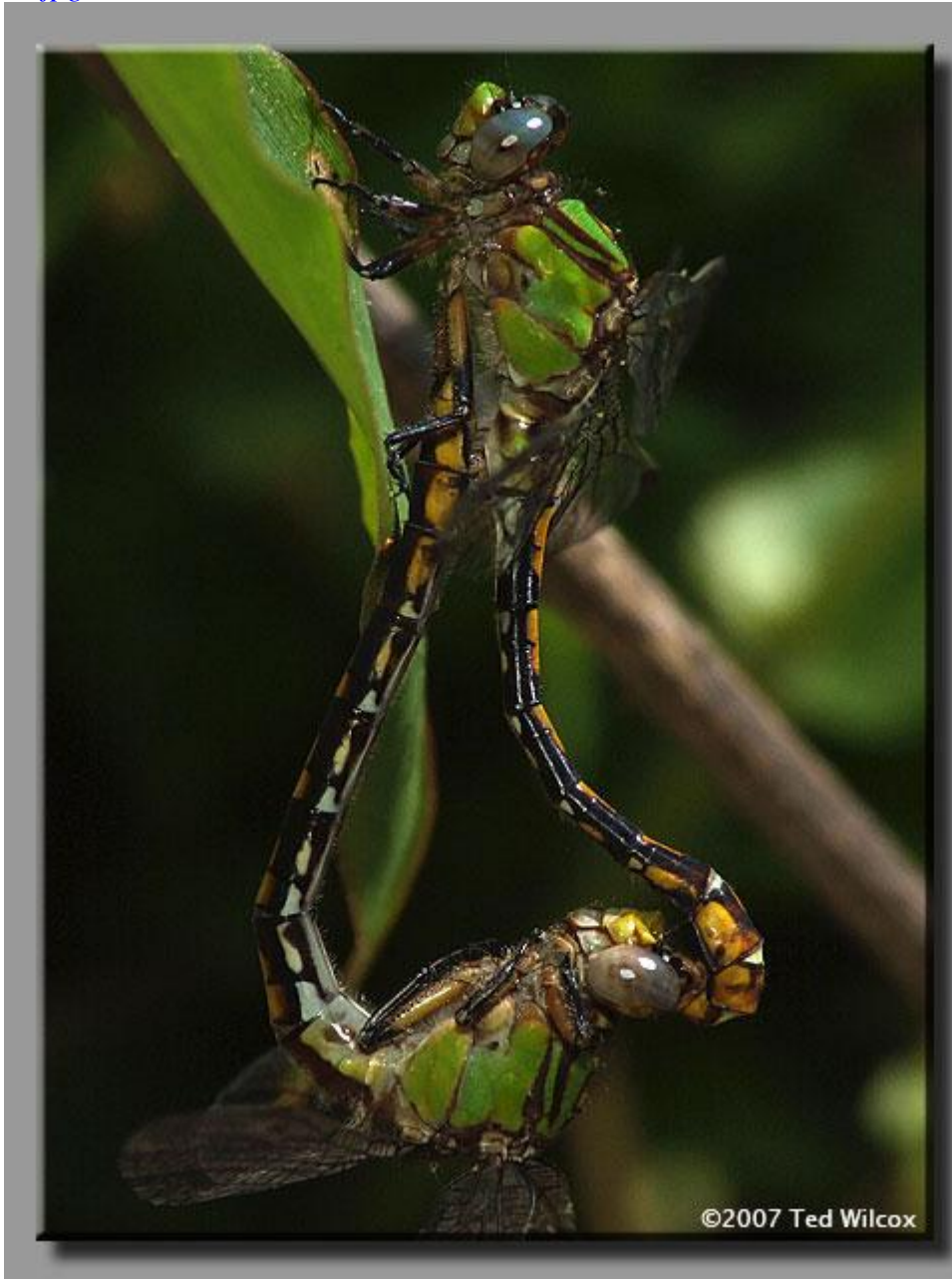
The adult dragonfly will not live beyond several months, depending on the quality of the weather. They may live as long as six months provided the weather is dry and warm. However, in the short and sometimes cold weather, adults will not live for longer than several weeks.

- from "How Long Do Dragonflies Live?" <http://www.dragonfly-site.com/how-long-dragonflies-live.html>

During their adulthood, they take the opportunity to mate and lay eggs, thereby continuing the lifecycle.

Appalachian Snaketail dragonflies mating photo taken from

<http://ncwings.carolinanature.com/dragonflies/clubtails/images/appalachian-Snaketail-05.jpg>



Why Should We Care?

Researchers look to dragonflies as ecological indicators. The presence of dragonflies indicates fresh water. Dragonflies reside low in the food chain, so scientific study of their numbers and their health can reveal changes in water ecosystems more quickly than studying other animals or plants.

Since dragonflies eat mosquitoes, horseflies, and other insects, they help gardeners and outdoor enthusiasts. Dragonflies help the environment by reducing the use of pesticides used to kill pests. They can also be used to help diminish diseases spread by mosquitoes, horseflies and deer flies by releasing dragonflies in areas where infestations of these insects exist.

- from "*Why Are Dragonflies Important?*"

http://www.ehow.com/info_10068965_dragonflies-important.html

A variety of animals depend on dragonflies as a food source. Dragonfly nymphs are eaten by frogs, fish, turtles, ducks, and other aquatic birds. Adults are eaten by frogs, fish, several species of birds, spiders, bats, and wasps.

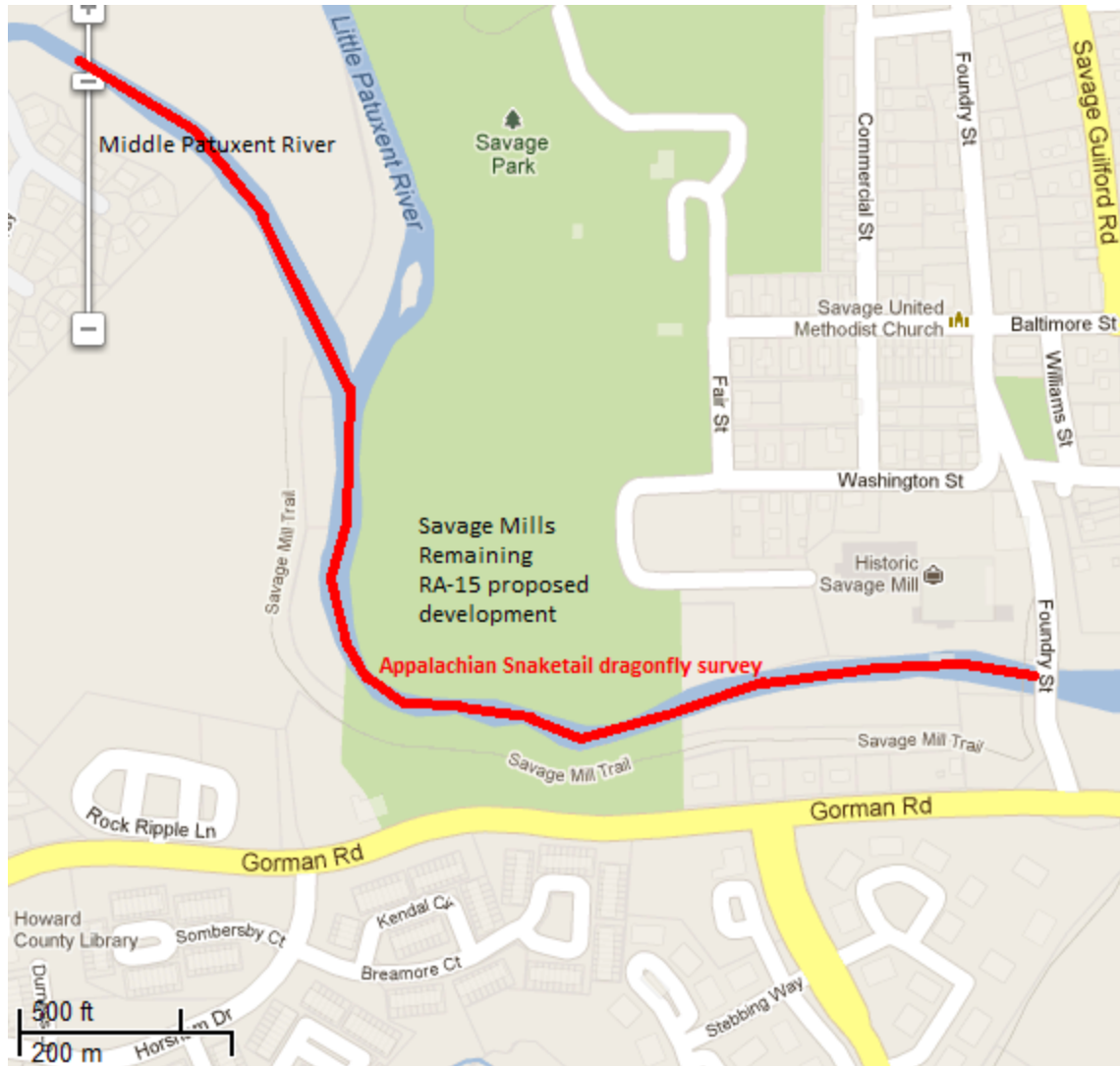
- from "*What Dragonflies Eat and What Eats Them*" <http://suite101.com/article/what-dragonflies-eat-and-what-eats-them-a138500>

In summary, dragonflies play an important role in our ecosystem, as predator, prey, and ecologic indicator.

Endangerment of the Appalachian Snaketail dragonfly

The Appalachian Snaketail dragonfly is a rare subspecies of dragonfly that lives in the area proposed for RA-15 development on the Savage Mill Remaining property.

This species has been studied by Dr. Richard Orr of the Mid-Atlantic Invertebrate Field Studies office. From 1993 to 1999, he did surveys of the Savage area from Foundry Road Bridge upstream to 150 yards above where the North [Little] Patuxent enters the Middle Patuxent to become the Little Patuxent.



Dr. Orr and two observers found numerous specimens and came to the conclusion that “Based on the cast skins the larval habitat is at, or near, the less intense rapids.”

Additionally,

“This is the highest concentration of this species in Maryland and likely is the highest concentration of this subspecies globally.”

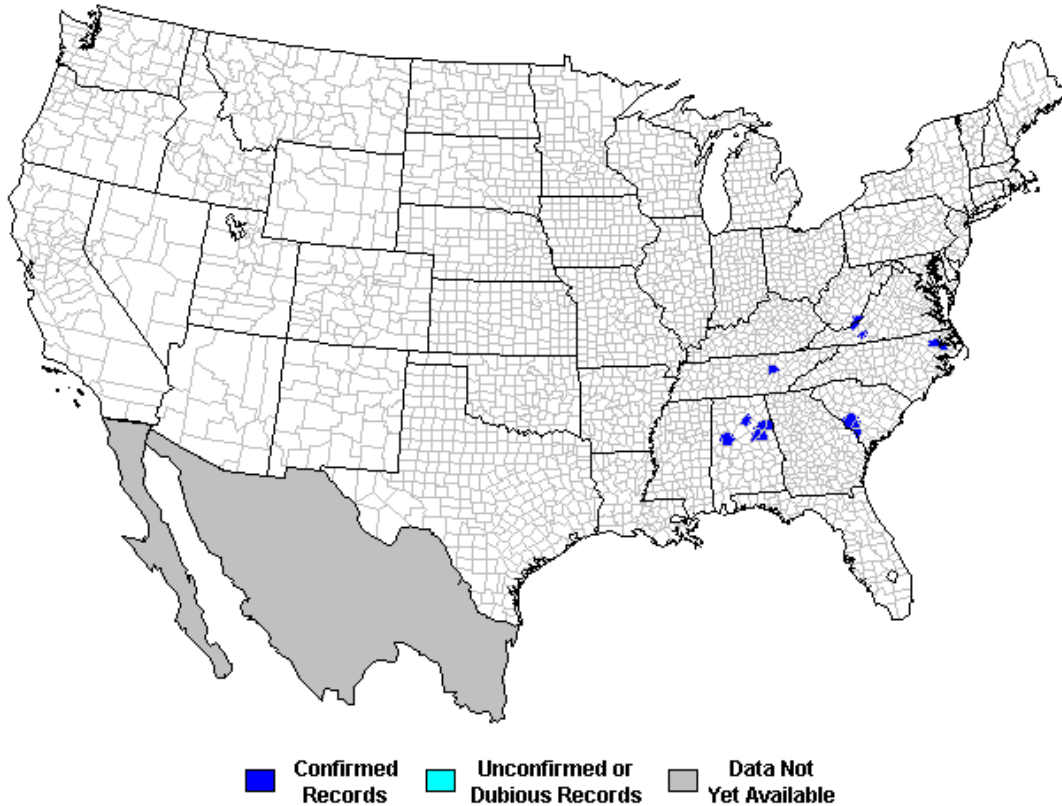
- from Maryland Department of Natural Resources (DNR) Field Survey Form (S1, S2, SH, SU, SR, SP) for Historical Records, form created December 26, 2005

The Appalachian Snaketail occurs in various parts of the mid-Atlantic and southern United States:

- the Appalachian Mountains
- central Maryland
- southeastern Pennsylvania
- southern West Virginia
- southwestern Virginia through the northeastern Georgia and western South Carolina,
- central Alabama

- west central Georgia
 - South Carolina in the lower piedmont, near Aiken
- from "Lepidoptera Odonata Web Atlas: Detail"
<http://www.vararespecies.org/spprofile.shtml?id=176>

Appalachian Snaketail (*Ophiogomphus incurvatus*)



- from "USGS - Dragonflies and Damselflies (Odonata) of the United States"
<http://www.npwrc.usgs.gov/resource/distr/insects/dfly/usa/240.htm>

At the global level, as of 1996, it is considered **Near Threatened**. Its population is decreasing. Near threatened means that it would be threatened were it not for an ongoing taxon-specific conservation program. A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

- from "International Union for Conservation of Nature"
<http://www.iucnredlist.org/details/15367/0>

A **taxon** is a group of one (or more) populations of organism(s), which a taxonomist adjudges to be a unit.

- from <http://en.wikipedia.org/wiki/Taxon>

Based on an April 2010 report by the Maryland Department of Natural Resources, Wildlife and Heritage Service, the Appalachian Snaketail dragonfly yields the following status:

Global rank: **G3T2T3**

State rank: S1

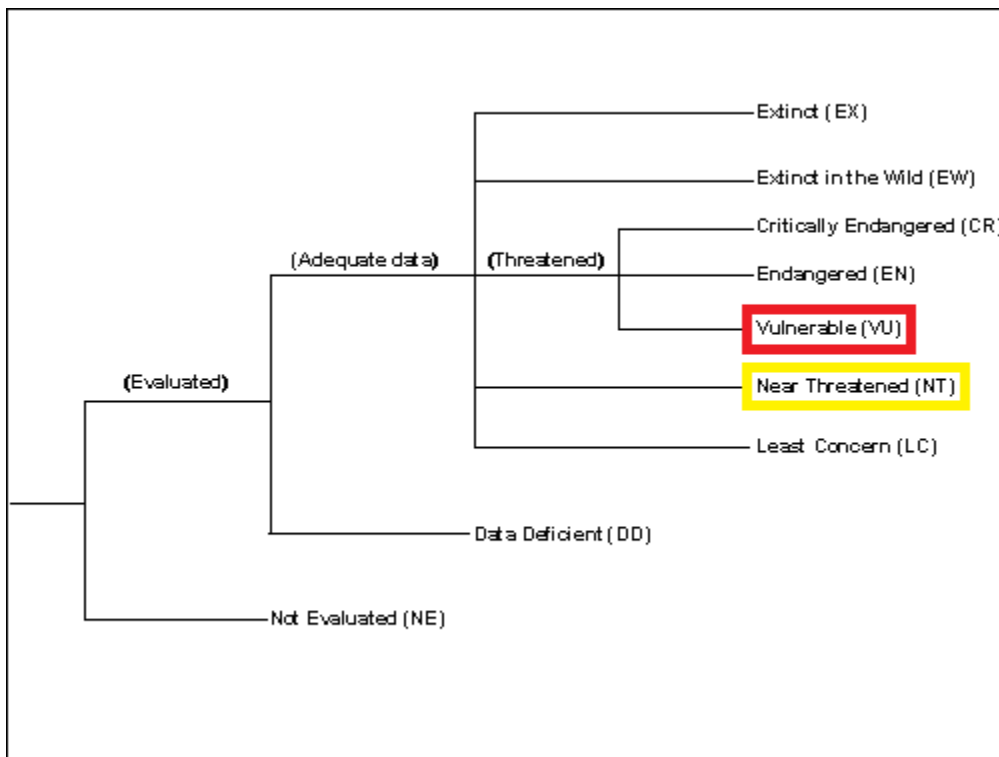
State status: E

- from "Current and Historical Rare, Threatened, and Endangered Species of Howard County, Maryland"

http://www.dnr.state.md.us/wildlife/Plants_Wildlife/rte/pdfs/rtehowa.pdf

Global rank: G3: Vulnerable - Vulnerable either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation (local extinction) or extinction.

Thus, over 14 years, the Appalachian Snaketail dragonfly is one step closer to extinction than it had been.



- from "International Union for Conservation of Nature"

http://www.iucnredlist.org/static/categories_criteria_3_1

State rank: S1: Critically imperiled because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation or extinction.

- from "About the Heritage Network Ranking System"

<http://www.cnhp.colostate.edu/about/heritage.asp>

This species in Maryland is "Highly state rare (S1) and state endangered. Globally rare/local throughout its range."

- from "Maryland Biodiversity Project"

<http://www.marylandbiodiversity.com/viewSpecies.php?species=658>

The next level above S1 is

SH: Possibly Extirpated or Extinct

Let's not get to this point.

State status: E; endangered. Taking or harassment of these species is a violation of federal laws.

- from http://www.wlf.louisiana.gov/wildlife/species-parish-list?order=field_s_status_value&sort=desc&tid=All&type_1=All

Let's protect the Appalachian Snaketail dragonfly while we still have something to protect.

Protecting the Appalachian Snaketail dragonfly

What is the best way to protect the Appalachian Snaketail dragonfly? PROTECT ITS ENVIRONMENT! Oppose new development in the area where it lives.

Ophiogomphus incurvatus is declining because of the unusual susceptibility of the larvae to flood scouring and pollution.

Larvae are susceptible to alterations in stream flow due to clear cutting/deforestation, agriculture, and development that produce flood scouring, siltation and pesticide use.

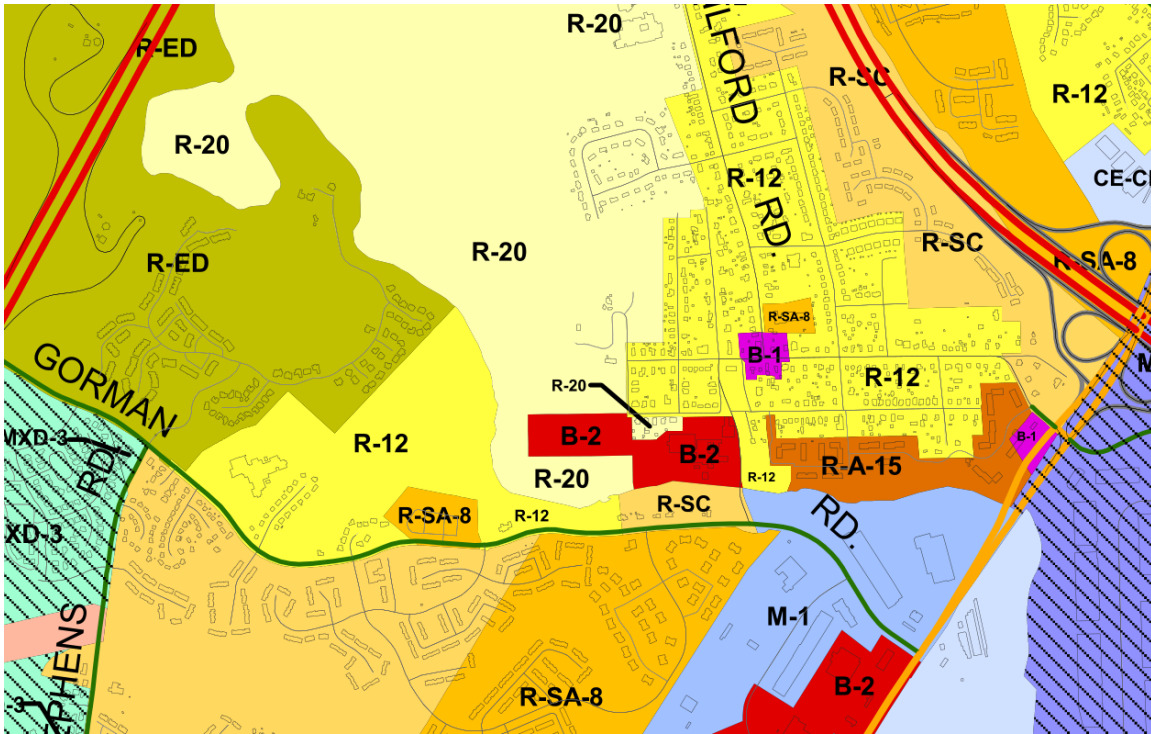
- from "International Union for Conservation of Nature"

<http://www.iucnredlist.org/details/15367/0>

The Savage Mill Remaining lot resides on about 5 acres of forested land in close proximity to about 1400 feet of the Little Patuxent River. How close? Most of the south edge of the property is only about 340 feet from the river while the west edge is 220 feet. The furthest point from the river on the lot is only about 850 feet away. The elevation drop over these distances is about 50 to 100 feet.

- based on studying satellite photos for Savage Mill Hotels (SDP-07-076) at

<http://data.howardcountymd.govGSearchPlans/GSearchPlans.asp>



If this land is developed as proposed, most of the trees that currently absorb stormwater runoff on the Savage Mill Remaining property will be removed and replaced by impermeable roads and at least 50 housing units.

The highest concentration in the world of the Appalachian Snaketail dragonfly lives in the area proposed for development. Allowing such a development would put its survival in great jeopardy.

What has been done in the past?

Protecting the environment for a rare species is nothing new in Maryland.

“The **Puritan tiger beetle**, *Cicindela puritana*, is listed as a threatened species under the federal **Endangered Species Act**. In Maryland, home to the beetle's largest global population, it is endangered.

About 5,000 Puritan tiger beetles are left on the planet, about 4,500 of them in Maryland, said **Glenn Therres**, a biologist who heads the endangered-species program at the Maryland Department of Natural Resources. The beetle is found only in Calvert, along the Sassafras River between Kent and Cecil counties and along the Connecticut River in New England. The population was as high as 11,000 in the 1980s, Therres said, and the decrease is largely due to the loss of habitat.



On average, cliffs along the Chesapeake Bay erode at a rate of less than two feet a year, said Bhaskar Subramanian of the Department of Natural Resources. That's ideal for the Puritan tiger beetle but not for property owners.”

"We try as best as we can to accommodate the wishes of the landowner, but we can't do it at the expense of an endangered species," Therres said.

- from "Cliff residents losing out to beetles on the brink" by Christy Goodman, January 25, 2010 http://articles.washingtonpost.com/2010-01-25/news/36792995_1_tiger-beetle-chesapeake-ranch-estates-cicindela

Hence, the property owners are being denied permission to protect their homes from eroding into the Bay.

If protecting a rare species comes before homeowners, shouldn't it also come before developers?

“The Puritan tiger beetle is listed by both the State and federal government as a threatened and endangered species. Permits are required to alter habitat supporting this species. If incidental take occurs, mitigation for that loss is required in order to obtain a permit.

The **Wildlife and Heritage Service Natural Heritage Program** tracks the status of over 1,100 native plants and animals that are among the rarest in Maryland and most in need of conservation efforts as elements of our State's natural diversity.”

- from *Maryland DNR, Endangered Species – Plants & Animals*

http://www.dnr.state.md.us/wildlife/Plants_Wildlife/espaa.asp

What can be done now?

Dr. Richard Orr proposed that a new survey be conducted. He is the world's leading expert on the Appalachian Snaketail dragonfly. The last survey was done on May 28, 1999. The previous three were all done in the latter half of May. As things stand, he would need to commence such a survey around this same time which would not work well with his current schedule so instead, he proposes 2014.

The survey would take approximately 5 field days during the 15 days – possibly more if he gets negative results. The cost would depend upon the length of the river sampled but \$5K (50% up front and 50% at the end) is his regular cost for this type of project.

A request has been made to Mr. James McCann, the Maryland DNR State Zoologist. He seems to think it might be possible to place limits on the development at the Savage Mill Remaining property. Unfortunately, he will be out of the office until May 28.

Contact was made with Tim Larney, **Habitat Conservation Program Manager** for the **Natural Heritage Program**. He explained his role in the environmental review process: “I can assure you that when this particular project comes to us for review and comment that we will analyze the potential impacts quite carefully and provide a stringent and thorough review. Our role in these sorts of matters is not regulatory in nature. It is to provide data and sound ecological guidance to the permitting agencies and local governments where the ultimate authority lies for land-use decisions (zoning and density). We take our responsibility seriously and we will do our best to see that all potential impacts are minimized or avoided altogether.”

I asked Mr. Larney if it would be helpful to forward him information I collected and he said no, since his office is not to work with third parties who are either in favor of or opposed to a given project. But he did offer the following advice:

“If your intentions are to become involved in this project in some way to help inform the ultimate decision I'd suggest working directly with your local county office of planning and development. It is in that setting that you will have the best opportunity to provide input and have your opinions and concerns heard. In the end, they have the local authority here and will have the final say in this matter.”

As things stand, we may not get any definite answers from the environmental side in the near future. However, we could request that the county places a hold on any development of the Savage Mills Remaining property until such answers are obtained.

In the meantime, it is not unreasonable to ask that the county purchase the Savage Mills Remaining property as an extension to the existing Savage Park. The Savage Mills Remaining property already has a network of trails for recreational use that are currently being used by TagParty Recon, a laser tag company. Such an addition to the park would not only serve the public from a recreational point of view but it would also protect the habitat of the rare Appalachian Snaketail dragonfly.

Preservation does come with a cost, but keep in mind that we are talking about the future of a rare species and its environment which is reported by a world leading expert to possibly be the highest concentration globally. Compare this to how much it would cost the 5th wealthiest county in the nation to purchase a mere 5 acres of land.

- from "Ellicott City Patch – Howard County Fifth Wealthiest in Nation"

<http://ellicottcity.patch.com/articles/howard-county-fifth-wealthiest-in-nation>

On May 29, 2013, I (Saki) made a PowerPoint presentation to our Savage Community Association and three council members (Jen Terrasa, Courtney Watson, and Calvin Ball). They were unaware of the presence of the Appalachian Snaketail dragonfly and promised to look into the matter further before making a final decision regarding zoning. There were about 40 members of the community present at the meeting. My presentation stirred up quite a bit of discussion. The community was in agreement that the ideal solution is for the county to purchase the proposed development site and add it as an extension of Savage Park. The three council members said they would consider that. I felt that the meeting was successful in that the council members present now understand that the Savage community is opposed to the Savage Mills Remaining property and aware that a rare dragonfly lives there in great abundance.

One June 12, 2013, I gave testimony at a rezoning hearing in front of the county council, asking that steps be taken to help ensure the survival of the Appalachian Snaketail dragonfly by preserving its habitat. The verbose document distributed to the council members resides at

<http://saki.iwarp.com/docs/SavageMillRemainingFinal130608.pdf>

Devils Advocate

Not everything is in our favor.

Glenn Therres: Fiscal, Legislation and Regulations Associate Director at MD DNR - Wildlife and Heritage Service says,

"The presence of an endangered species will not stop a development project. At best, it may modify the development plan depending on the situation and if a state permit is required."

While the Appalachian Snaketail dragonfly is rare, it is nowhere near as rare as the Puritan tiger beetle. Our dragonfly is endangered in Maryland but lives in plenty of other

states. Globally, it is considered “vulnerable” but there are plenty of species that are more endangered than it.

The data that claims the Appalachian Snaketail dragonfly may have its highest concentration globally here in Savage is based on surveys that are not more recent than 1999. It might be difficult to find someone willing pay \$5000 for another survey.

Photo of Appalachian Snaketail dragonfly taken from
http://www.haysophill.com/Ophiogomphus_incurvatus.html#2



We do not inherit the earth from our ancestors; we borrow it from our children.
- Author unknown

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